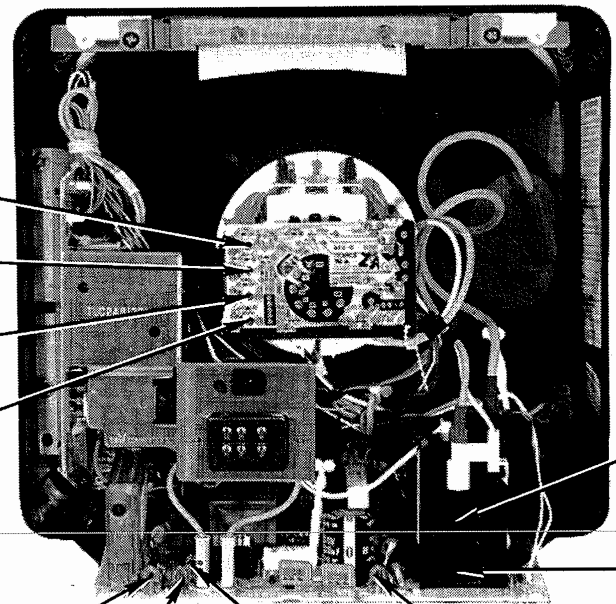
CABINET - REAR VIEW



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2932

SET 2932

MODELS CTN-1050R/51R/60R/61R

PANASONIC

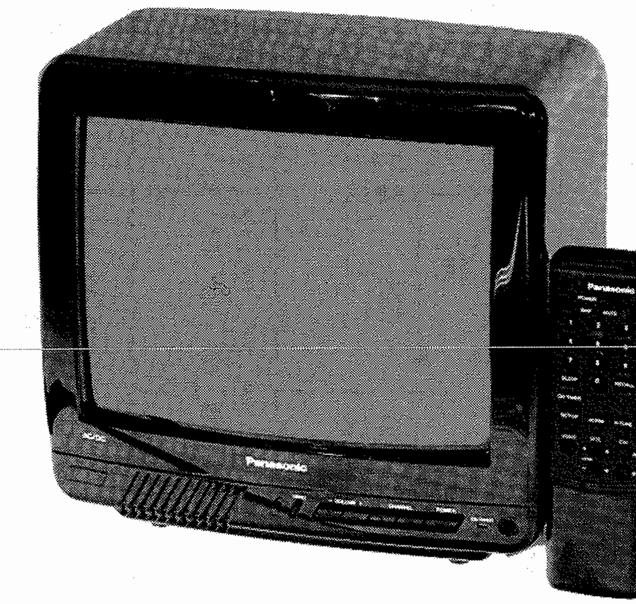
For Supplier Address,
See PHOTOFACT Annual Index

PHOTOFACT® Technical Service Data

2932

PANASONIC

Model CTN-1061R (Chassis AMDP215)



Essential coverage for servicing a television receiver...

- **Schematics**
- **Component locations**
- **Parts lists**

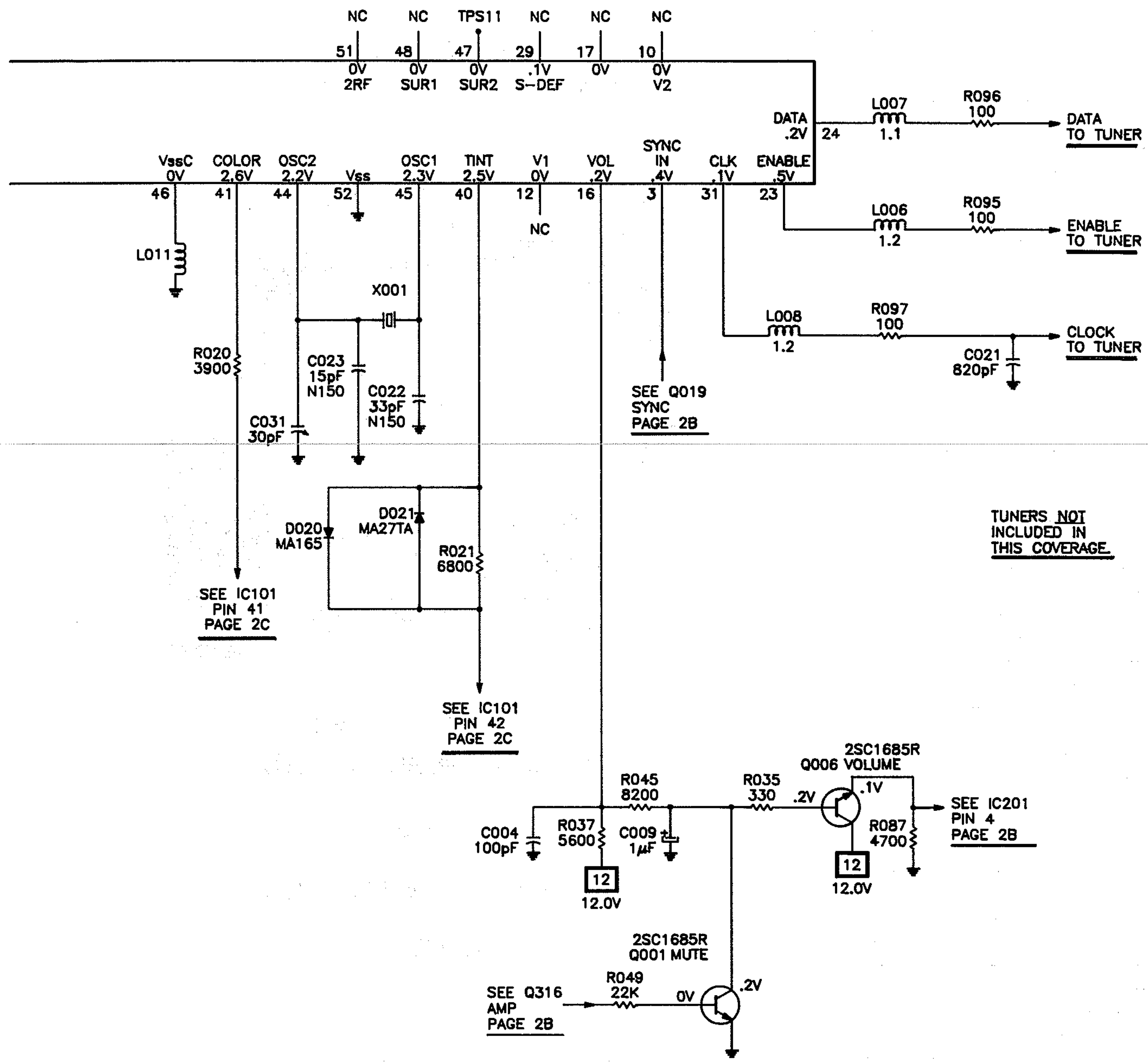
Coverage includes these additional models and chassis:

MODEL	CHASSIS
CTN-1050R	ANDP215
CTN-1051R	APDP215
CTN-1060R	AMDP215

HOWARD W. SAMS & COMPANY

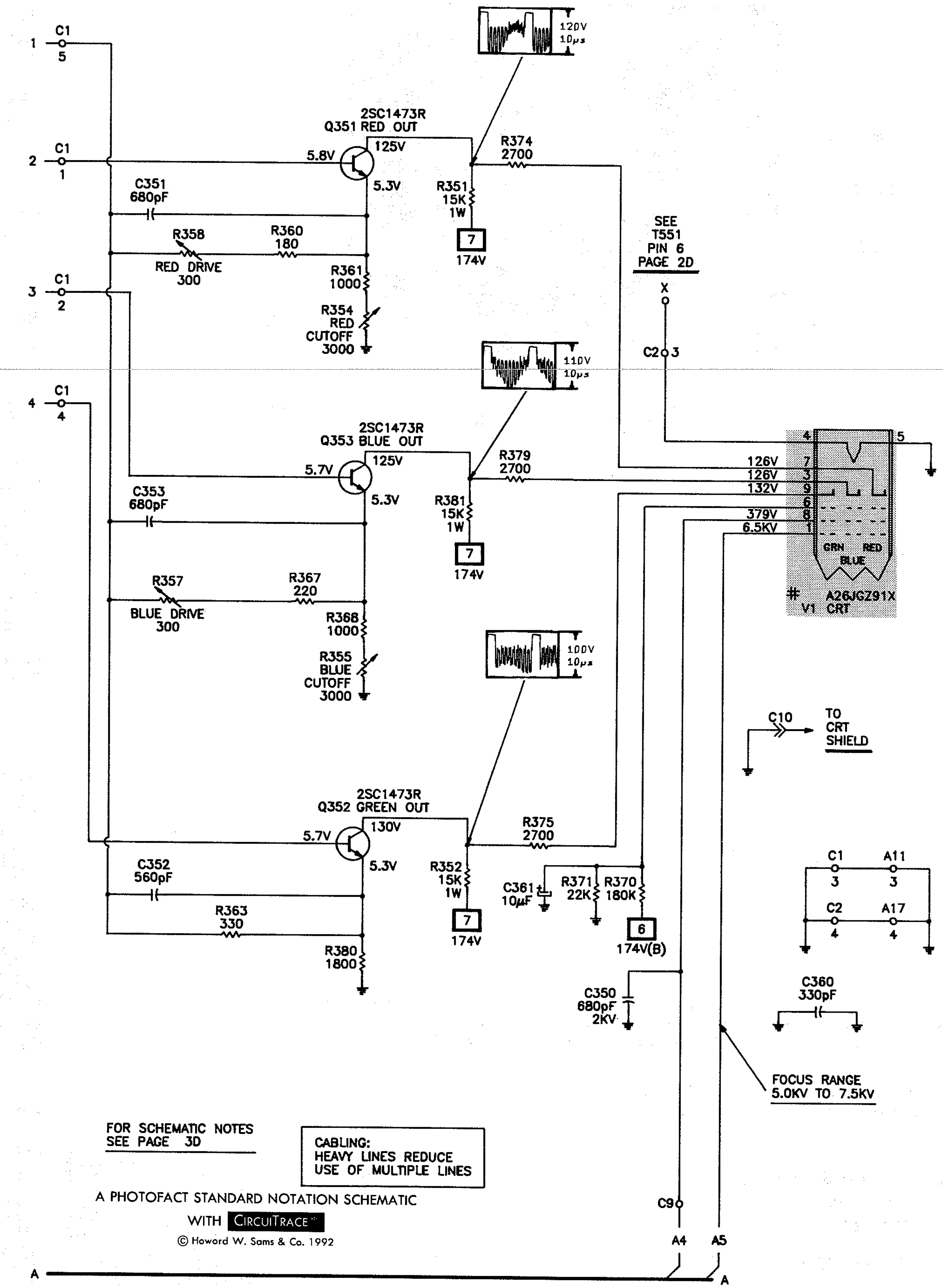
JANUARY 1992 SET 2932

SELECTOR/TUNER CONTROL SCHEMATIC continued



G

CRT SCHEMATIC



FOR SCHEMATIC NOTES SEE PAGE 3D

CABLING: HEAVY LINES REDUCE USE OF MULTIPLE LINES

A PHOTOFACT STANDARD NOTATION SCHEMATIC WITH CIRCUITRACE

H

PANASONIC

MODELS CTN-1050R/51R/60R/61R

CAPACITORS

	Item	Rating	Mfr. Part No.
	C022	33 5% 50V N150	ECCF1H330JP
	C023	15 5% 50V N150	ECCF1H150JP
	C031	30 Trimmer	ECRHA030E41
	C103	6 ±.25pF 50V NPO	ECCF1H060CC
	C104	2 ±.25pF 50V NPO	ECCF1H020CC
	C112	18 5% 50V NPO	ECCF1H180J
	C151	68 5% 50V NPO	ECCF1H680JC
	C152	15 5% 50V NPO	ECCF1H150JC
	C155	2 ±.25pF 50V NPO	ECCF1H020CC
	C207	68 10% 50V N150	ECCF1H680KP
	C350	680 10% 2KV	ECKD3D681KB
	C355	.001 10% 500V	ECKD2H102KB
	C503	220 5% 50V N750	ECCF1H221JU
#	C513	10 1% 500V	ECCD2H100F
#	C514	820 10% 500V	ECKD2H821KB
#	C515	820 10% 500V	ECKD2H821KB
#	C551	.18 5% 200V	ECQF2H184JS
#	C554	560 10% 500V	ECKD2H561KB
#	C555	560 10% 500V	ECKD2H561KB
#	C562	.001 5% 2KV (1)	ECKD3D102JB
		.0012 5% 2KV	ECKD3D122JB
		.0015 5% 2KV	ECKD3D152JB
#	C564	.0047 5% 1.2KV	ECWH12H472JS
#	C568	560 10% 500V	ECKD2H561KB
	C605	8 ±.5pF 50V N750	ECCF1H080DU
	C607	100 10% 50V NPO	ECKF1H101KB
	C608	100 10% 50V NPO	ECKF1H101KB
	C609	100 10% 50V NPO	ECKF1H101KB
#	C803	.0047 +100% -0% 500V	ECKD2H472PU
#	C804	.0047 +100% -0% 500V	ECKD2H472PU
#	C817	.015 10% 125VAC	ECQU1A153KH
#	C818	.015 10% 125VAC	ECQU1A153KH
	C853	330 10% 500V (2)	ECKD2H331KB
	C863	33 5% 50V (2)	ECCF1H330J
	C864	.0047 10% 500V (2)	ECKD2H472KB
	C866	.01 10% 500V (2)	ECKD2H103KB

(1) Replace with original value only
(2) Used in Models CTN-1060R, CTN-1061R.
For SAFETY use only equivalent replacement part.

ELECTROLYTIC CAPACITORS

	Item	Rating	Mfr. Part No.
	C452	1.0 25V	ECSF25E1VB
#	C531	33 25V	ECEA1EU330
#	C552	220 25V	ECEA1EU221
#	C553	22 250V	ECEA2EU220W
#	C559	220 25V	ECEA1EGE221
#	C566	220 35V	ECEA1VGE221
#	C805	220 200V	ECE52DU221E4
#	C806	10 160V	ECEA2CGE100
#	C812	33 160V	ECEA160V33Z

For SAFETY use only equivalent replacement part.

COILS (RF-IF)

	Item No.	Rating	Mfr. Part No.
	L006	5.6uH	TLUABTASR6K
	L007	5.6uH	TLUABTA5R6K
	L008	5.6uH	TLUABTA5R6K
	L011	1.0uH	TLUABTA1ROK
	L103	AFT	TL167394-1
	L104	1.2uH	TL0012K205C
	L105	VCO	TL1158755
	L106	15uH	TLUABTA150K
	L108	1.2uH	TL0012K205C
	L201	Quadrature	TLS63318-2
	L202	4.7uH	TLUABTA4R7K
	L301	3.58MHz Trap	ELB5A082
	L354	150uH	TLUABTA151K
#	L801	Line Choke (1)	ELF18D217
#	L801	Line Choke (2)	ELF18D219
	L851	5.6uH (2)	TLT056K109R
	L852	5.6uH (2)	TLT056K109R
	L860	150uH (2)	TLT151K991R

(1) Used in Models CTN-1050R, CTN-1051R.
(2) Used in Models CTN 1060R, CTN-1061R.
For SAFETY use only equivalent replacement part.

CONTROLS

(All wattages 1/2 watt or less, unless otherwise listed.)

Item No.	Function	Resistance	Mfr. Part No.
R106	AGC	5K	EVN60AA00B53
R304	Sub-Contrast	2K	EVND4AA00B23
R318	Sub-Bright	10K	EVN60AA00B14
R354	Red Low	3K	EVN49AA00B33
R355	Blue Low	3K	EVN49AA00B33
R357	Blue High	300	EVN49AA00B32
R358	Red High	300	EVN49AA00B32
R453	Vertical Size	50K	EVN60AA00B54
R619	Sub-Tint	5K	EVN60AA00B53
R855	B+ Adjust (1)	500	EVN60AA00B52

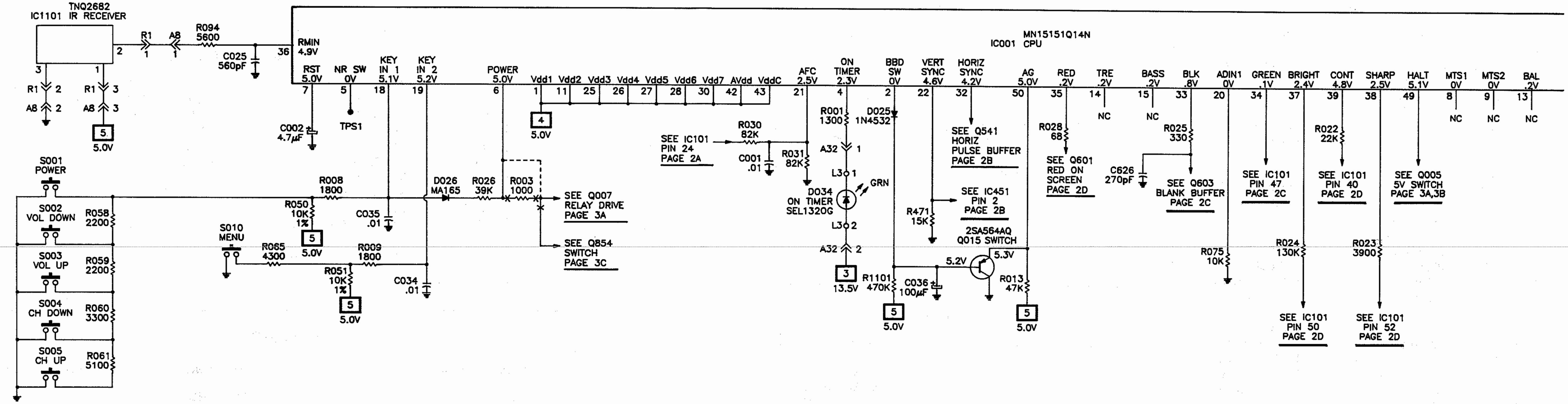
(1) Used in Models CTN-1060R, CTN-1061R

RESISTORS

	Item No.	Rating	Mfr. Part No.	NTE Replacement
#	D806	7.2 Cold PTC	ERPF50M080F	-
	R050	10K 1% 1/4W Mtl Flm	ER0S2CKF1002	-
	R051	10K 1% 1/4W Mtl Flm	ER0S2CKF1002	-
	R206	22 5% 1W Fusible	ERQ1CJP220	F1W022
#	R509	5600 5% 2W Mtl Flm	ERG25J5562	2W256
#	R510	3300 5% 2W Mtl Flm	ERG2ANJ332	2W233
#	R531	47 5% 1/4W Carbon	ERD25FJ470	QW047
#	R532	182K 1% 1/4W Mtl Flm	ER0S2CKF1823	-
#	R533	4640 1% 1/4W Mtl Flm	ER0S2CKF4641	-
#	R551	1 5% 1/2W Carbon	ERDS1FJ1R0	HW1D0
#	R552	1 5% 1/2W Carbon	ERDS1FJ1R0	HW1D0
#	R553	1 5% 1/2W Carbon	ERDS1FJ1R0	HW1D0
#	R558	2 5% 1W Fusible	ER01CJP2R0	F1W2D0
#	R562	1200 5% 1W Mtl Flm	ERG1SJ122	1W212
#	R569	100 5% 1/2W Carbon	ERDS1TJ101	HW110
#	R801	5600 10% 3W Wirewound	ERF3AK5R6	-
#	R802	220 5% 10W Wirewound	ERF10ZJ221	10W122
#	R804	220K 5% 1/4W Carbon	ERDS2TJ224	QW422
#	R805	10K 5% 1/2W Carbon	ERDS1TJ103	HW310
#	R807	47 5% 1/4W Carbon	ERD25FJ470	QW047
#	R808	33 5% 1/4W Carbon	ERD25FJ330	QW033
#	R810	18 5% 3W Wirewound	ERF3AJ180	-
#	R815	2.7M 10% 1/2W Carbon	ERC12ZGK275	HW527
	R851	33 5% 3W Carbon	ERG3SJ330 (1)	3W033
#	R854	107K 1% 1/4W Mtl Flm	ER0S2CKF1073 (1)	-
#	R856	4870 1% 1/4W Mtl Flm	ER0S2CKF4871 (1)	-

(1) Used in Models CTN-1060R, CTN-1061R.
For SAFETY use only equivalent replacement part.

SELECTOR/TUNER CONTROL SCHEMATIC



FOR SCHEMATIC NOTES SEE PAGE 3D

E

F

PARTS LIST

Important Parts Information

- The parts listed here are those not usually available from a well-stocked supply cabinet or bin.
- Where items may be replaced with equivalent parts, several alternates are shown from participating vendors.
- On the parts lists, safety items are marked with a # to remind you that only exact replacements are recommended for these items.
- When ordering parts, state the model number, part number, and description.

Obtaining Parts

Many of these parts are available from your local Sams authorized distributor or the manufacturer of the equipment. Call Sams for the name of your nearest distributor:

800-428-7267

Or consult the Sams *Annual Index* for the address of the original equipment manufacturer.

Participating Vendors

Information on test equipment and replacement parts is listed in these pages for the following participating vendors. Consult the Sams *Annual Index* for their current address.

- B&K Precision
- Custom Components Corporation (Chek-A-Color)
- EVG / Russell Industries, Inc.
- NTE Electronics, Inc. (NTE)
- Philips ECG Company (ECG)
- PTS Electronics Corporation (PTS)
- Quam-Nichols Co. (Quam)
- Sencore, Inc.
- Thomson Consumer Electronics, Inc. (SK, TCE)

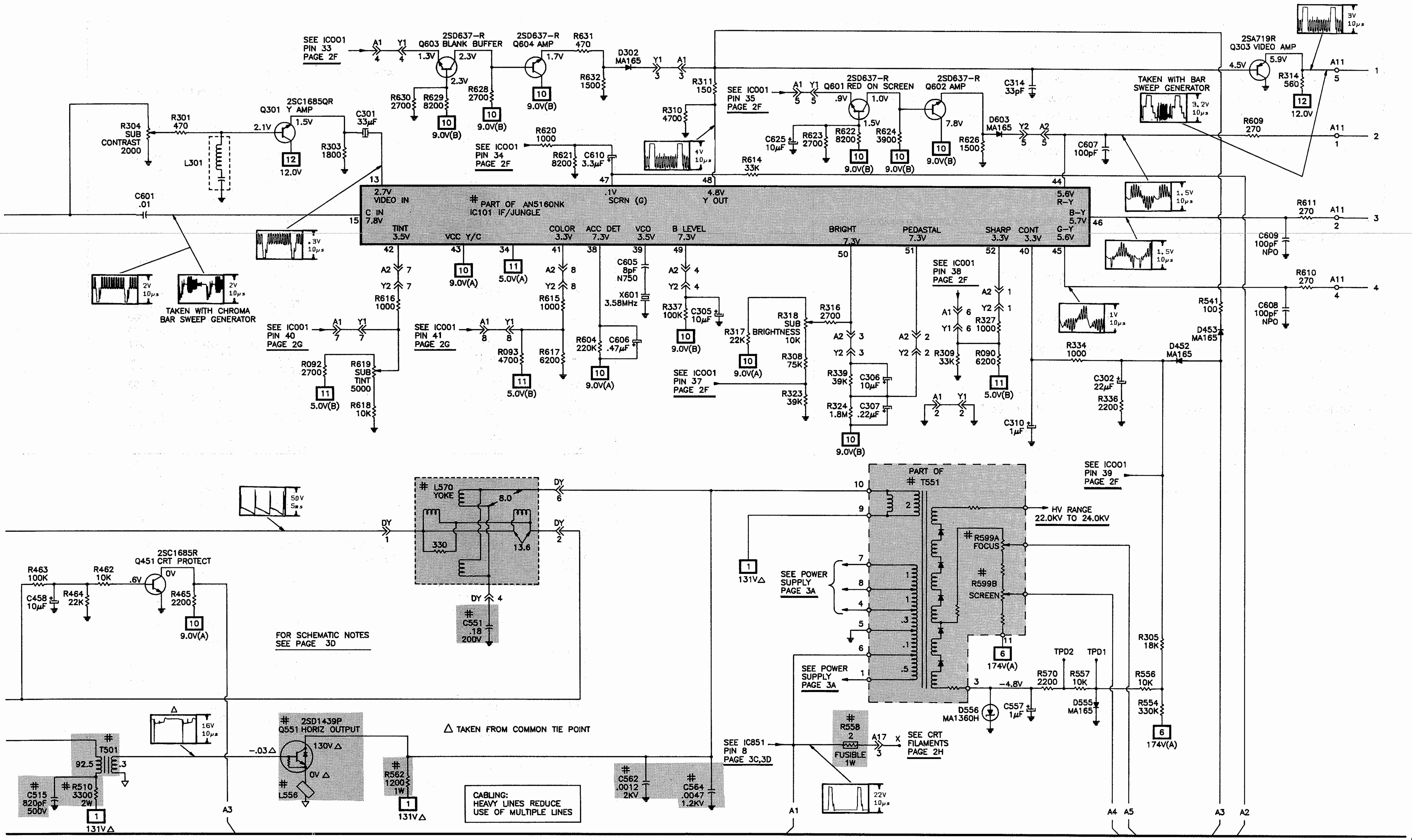
SEMICONDUCTORS

(Select replacement for best results.)

	Item No.	Type No.	Mfr. Part No.	NTE Part No.	ECG Part No.	TCE Part No.
	D004	MA165	-	NTE519	ECG519	SK3100
	D005	MA4051L	-	-	-	-
	D020	MA165	-	NTE519	ECG519	SK3100
	D021	MA27TA	-	NTE605A	ECG605A	SK7952
	D022	MA165	-	NTE519	ECG519	SK3100
	D025	1N4532	-	NTE177	ECG177	SK9091
		MA150	-	NTE177	ECG177	SK9091
	D026	MA165	-	NTE519	ECG519	SK3100
	D031	AM01Z	-	NTE116	ECG116	SK3313
		ERA1501	-	NTE552	ECG552	SK9000
	D032	1N4532	-	NTE177	ECG177	SK9091
	D034	SEL1320G	-	NTE3167	ECG3167	SK2167
	D040	MA165	-	NTE519	ECG519	SK3100
	D302	MA165	-	NTE519	ECG519	SK3100
	D451	ERA15-01	-	NTE552	ECG552	SK9000
	D452, 3	MA165	-	NTE519	ECG519	SK3100
	D456	MA4120M	-	NTE5021T1	ECG5021T1	SK9971
	D457	MA4110	-	NTE5020A	ECG5020A	SK11A
	D502	MA4082	-	NTE5016A	ECG5016A	SK8A2
	D503, 4, 5	MA165	-	NTE519	ECG519	SK3100
	D506	MA4062	-	NTE5013A	ECG5013A	SK6A2
#	D531	AS01	-	NTE552	ECG552	SK9000
		AU01	-	NTE552	ECG552	SK9000
		ERA2204	-	NTE552	ECG552	SK9000
	D541	MA4051M	-	NTE5010A	ECG5010A	SK5A1
#	D551	RU2N	-	NTE552	ECG552	SK9000
#	D552, 3, 4	AS01	-	NTE552	ECG552	SK9000
		AU01	-	NTE552	ECG552	SK9000
		ERA2204	-	NTE552	ECG552	SK9000
	D555	MA165	-	NTE519	ECG519	SK3100
	D556	MA1360H	-	-	-	-
	D557	QB105N	TVSQB105N	NTE135A	ECG135A	SK5V1
	D560	QB109SA	TVSQB109SA	-	-	-
	D603	MA165	-	NTE519	ECG519	SK3100
#	D801 - D804	RM11B	-	NTE125	ECG125	SK3081
		EM02BM	-	NTE125	ECG125	SK3081
		EM02BMV	-	NTE125	ECG125	SK3081
		ERC13-08	-	NTE125	ECG125	SK3081
		ERC12-08	-	NTE125	ECG125	SK3081
#	D806 (1)	-	ERPF5B0M080F	-	-	-
	D851	EU2A	TVSEU2A	NTE552	ECG552	SK9000
	D852	RGP10J	-	NTE552	ECG552	SK9000
#	D853	RD6.2EB1	TVSRD6.2EB1	NTE5012A	ECG5012A	SK6A0
	D855, 6	MA165	-	NTE519	ECG519	SK3100
	D857	RGP10J	-	NTE552	ECG552	SK9000
	D858	AS01	-	NTE552	ECG552	SK9000

(1) Used in some versions.
For SAFETY use only equivalent replacement part.

TELEVISION SCHEMATIC continued



PARTS LIST continued

SEMICONDUCTORS continued

(Select replacement for best results.)

Item No.	Type No.	Mfr. Part No.	NTE Part No.	ECG Part No.	TCE Part No.
D860	MA4062M	-	NTE5013A	ECG5013A	SK6A2
D861	AS01	-	NTE552	ECG552	SK9000
	AU01	-	NTE552	ECG552	SK9000
	ERA2206	-	-	-	-
	RGP10J	-	NTE552	ECG552	SK9000
D862	MA4062L	-	NTE5012A	ECG5012A	SK6A0
D863	MA165	-	NTE519	ECG519	SK3100
D864	ERA22-04	-	NTE116	ECG116	SK3312
	ERA22-04V3	-	NTE116	ECG116	SK3312
	AS01	-	NTE552	ECG552	SK9000
	AU01	-	NTE552	ECG552	SK9000
D865, 7	MA165	-	NTE519	ECG519	SK3100
D868, 9	AS01	-	NTE552	ECG552	SK9000
	AU01	-	NTE552	ECG552	SK9000
	ERA2204	-	NTE552	ECG552	SK9000
IC001	MN15151Q14N	-	-	-	-
	MN15151Q14R	-	-	-	-
# IC101	AN5160NK	-	-	-	-
	AN5160NK-N	-	-	-	-
IC201	AN5265	-	NTE1789	ECG1789	SK9876
IC451	LA7835	-	NTE1855	ECG1855	SK10085
	LA7835-TV	-	NTE1855	ECG1855	SK10085
# IC551	AN78M12	-	NTE966	ECG966	SK3592
	AN78M12LB	-	NTE966	ECG966	SK3592
# IC801	STR30130	TVSSTR30130	NTE1777	ECG1777	SK9870
IC851	AN5900	-	-	-	-
Q001, 4	2SC1685R	-	NTE85	ECG85	SK9229
	2SC1685QR	-	NTE85	ECG85	SK9229
	2SC1685TAQR	-	NTE85	ECG85	SK9229
Q005	2SA564AQ	-	NTE290A	ECG290A	SK3932
	2SA564AQR	-	NTE290A	ECG290A	SK3932
	2SA564ATAQR	-	NTE290A	ECG290A	SK3932
Q006, 7	2SC1685R	-	NTE85	ECG85	SK9229
	2SC1685QR	-	NTE85	ECG85	SK9229
	2SC1685TAQR	-	NTE85	ECG85	SK9229
Q015	2SA564AQ	-	NTE290A	ECG290A	SK3932
	2SA564AQR	-	NTE290A	ECG290A	SK3932
	2SA564ATAQR	-	NTE290A	ECG290A	SK3932
Q019	2SC1685R	-	NTE85	ECG85	SK9229
	2SC1685QR	-	NTE85	ECG85	SK9229
	2SC1685TAQR	-	NTE85	ECG85	SK9229
Q102	2SC1685R	-	NTE85	ECG85	SK9229
	2SC1685QR	-	NTE85	ECG85	SK9229
	2SC1685TAQR	-	NTE85	ECG85	SK9229
Q301	2SC1685QR	-	NTE85	ECG85	SK9229
	2SC1685TAQR	-	NTE85	ECG85	SK9229
Q303	2SA719R	-	NTE290A	ECG290A	SK3114A
	2SA719QR	-	NTE290A	ECG290A	SK3114A

For SAFETY use only equivalent replacement part.

SEMICONDUCTORS continued

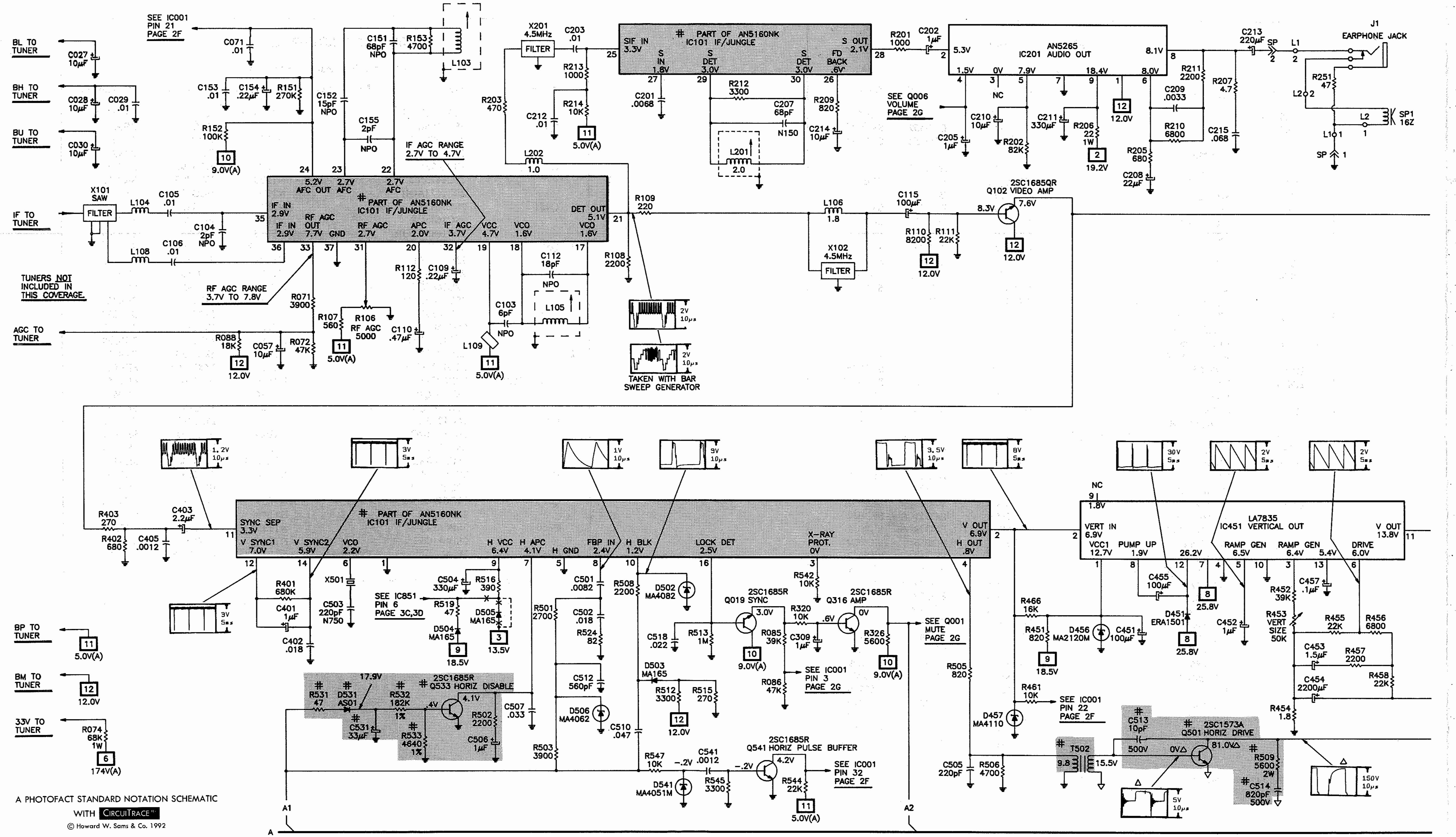
(Select replacement for best results.)

Item No.	Type No.	Mfr. Part No.	NTE Part No.	ECG Part No.	TCE Part No.
	2SA719TAQR	-	NTE290A	ECG290A	SK3114A
Q316	2SC1685R	-	NTE85	ECG85	SK9229
	2SC1685QR	-	NTE85	ECG85	SK9229
	2SC1685TAQR	-	NTE85	ECG85	SK9229
Q351 - Q353	2SC1473R	-	NTE399	ECG399	SK9352
	2SC1473NC	-	NTE399	ECG399	SK9352
	2SC1473AQH	-	NTE399	ECG399	SK9352
Q451	2SC1685R	-	NTE85	ECG85	SK9229
	2SC1685QR	-	NTE85	ECG85	SK9229
	2SC1685TAQR	-	NTE85	ECG85	SK9229
# Q501	2SC1573A	-	NTE399	ECG399	SK9352
	2SC1573AH	-	NTE399	ECG399	SK9352
# Q533	2SC1685R	-	NTE85	ECG85	SK9229
	2SC1685QR	-	NTE85	ECG85	SK9229
	2SC1685TAQR	-	NTE85	ECG85	SK9229
Q541	2SC1685R	-	NTE85	ECG85	SK9229
	2SC1685QR	-	NTE85	ECG85	SK9229
	2SC1685TAQR	-	NTE85	ECG85	SK9229
# Q551	2SD1439P	-	NTE2302	ECG2302	SK9422
	2SD1439PLB	-	NTE2302	ECG2302	SK9422
Q601 - Q604	2SD637-R	-	NTE16	ECG16	SK9664
	2SD637QR	-	NTE16	ECG16	SK9664
	2SC1685QR	-	NTE85	ECG85	SK9229
Q851	2SC1383R	-	NTE293	ECG293	SK3849
	2SC1383NC	-	NTE293	ECG293	SK3849
Q852	2SC3300	-	NTE2304	ECG2304	SK9985
	2SC3300ALF	-	NTE2304	ECG2304	SK9985
Q854	2SD637-R	-	NTE16	ECG16	SK9664
	2SD637PQR	-	NTE16	ECG16	SK9664
Q855	2SB642-R	-	NTE19	ECG19	SK3912
	2SB642QR	-	NTE19	ECG19	SK3912
Q860	2SB641-Q	-	NTE19	ECG19	SK9667
	2SB641QR	-	NTE19	ECG19	SK9667
Q861	2P5M	TVS2P5M	NTE5458	ECG5458	SK9861

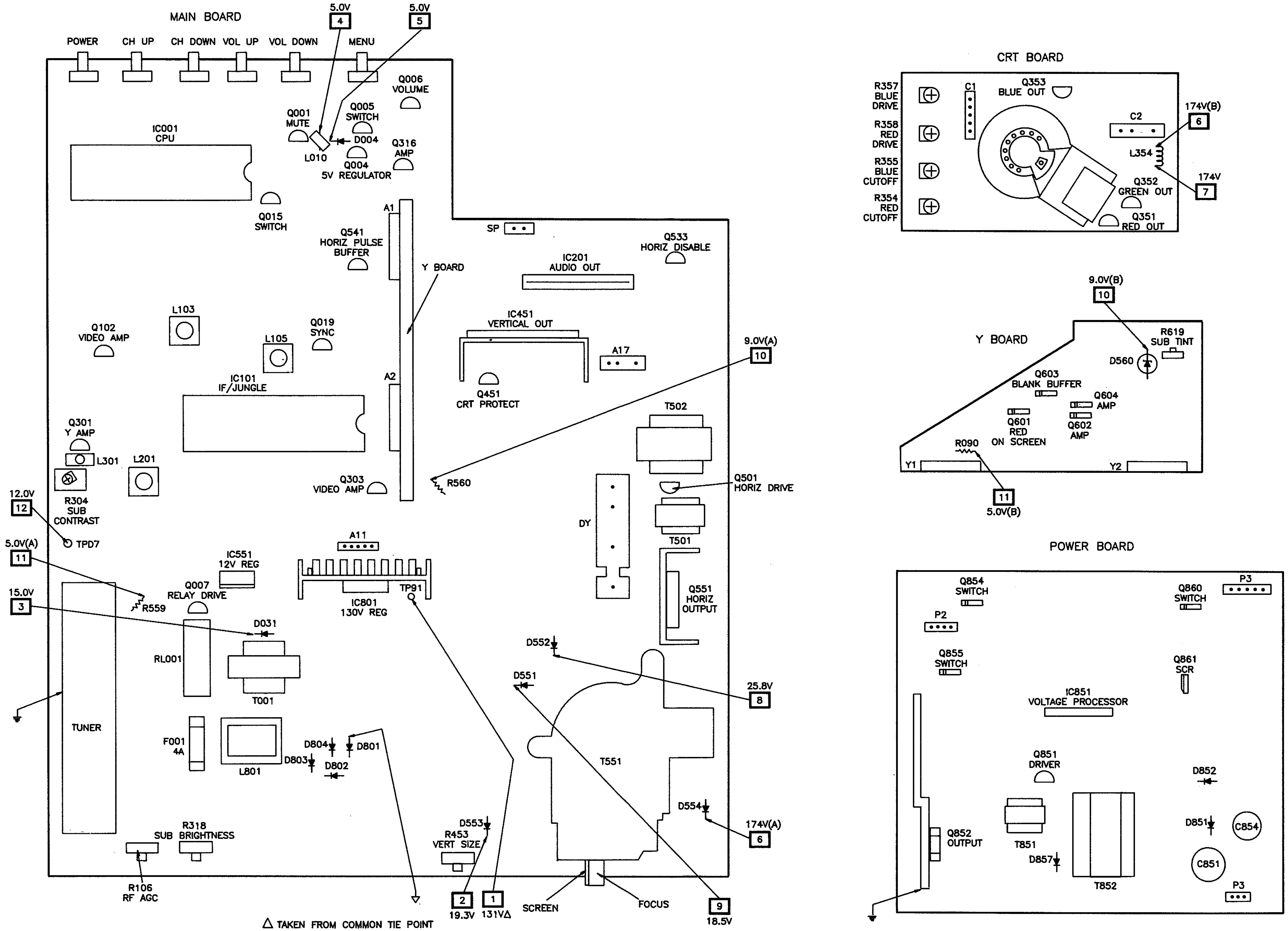
For SAFETY use only equivalent replacement part.

A B

TELEVISION SCHEMATIC



PLACEMENT CHART



NOTES

NOTES

TEST EQUIPMENT

Test equipment listed by participating manufacturers illustrates typical or equivalent equipment used by Sams engineers to obtain measurements. This equipment is compatible with most types used by field service technicians.

Equipment	B&K Precision No.	Sencore No.
Oscilloscope	1541A, 2120, 2125, 2160, 2190, 2522	SC61
Generators		
RGB	1249A, 1260	RG67
Multiburst Signal	1251, 1260	VA62A
Color Bar	1211A, 1249A, 1251, 1260	VA62A, CG25,NT64
TV Stereo	2009	ST65, ST66
Analog VOM	114, 117, 177, 214	-
Digital VOM	377, 388HD, 2700 Series, 2831A, 2860, 2900 Series	DVM37, DVM56A, SC61
Frequency Meter	1803A, 1804A, 1805, 1822, 1851, 1855	FC71, SC61
Hi-Voltage Probe	HV-44	HP200
VOM/DMM	-	TP212
Accessory Probes	PR-28(HV)	-
Isolation Transformer	TR110, 1604, 1653, 1655	PR57
Capacitance Analyzer	810A, 815, 820, 830	LC76, LC101, LC102
CRT Analyzer	480, 490	CR70
Temperature Probe	TP-28, TP-30	-
AC Leakage Tester	1655	PR57
Logic Probe	DP21, DP51	-
Logic Pulser	DP31, DP101	-
Inductance Analyzer	875A	LC76, LC101, LC102
Flyback Yoke Tester	875A	VA62A, LC76, LC101, LC102
TV Stereo Power Monitor	-	SR68
Field Strength Meter	-	FS73, FS74
Transistor Tester	510, 520B, 530	TF46
Video Analyzer	-	VA62A
Modulator/Converter	1201	

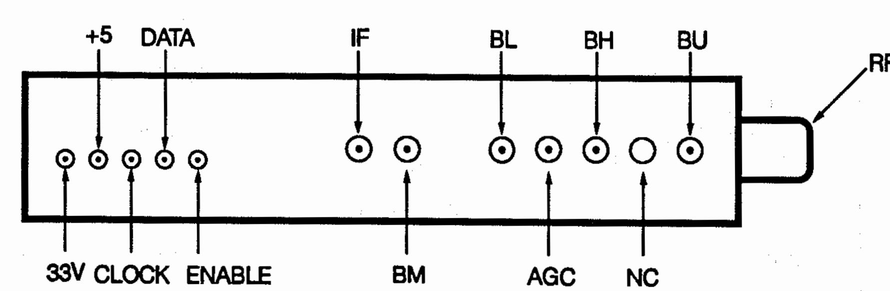
TUNER INFORMATION

TUNER VOLTAGE CHART

	VHF Low Band	VHF High Band	UHF Band
33V	3.5V	6.6V	7.4V
5.0V	5.0V	5.0V	5.0V
CLK	.1V	.1V	.1V
DATA	.1V	.2V	.1V
ENA	.6V	.6V	.6V
IF	0V	0V	0V
BM	12.0V	12.0V	12.0V
BL	12.0V	4.0V	.1V
AGC	7.8V	7.8V	8.7V
BH	0V	11.8V	0V
NC	1.0V	4.0V	5.0V
BU	.1V	.1V	12.0V

Note: VHF Low Band voltages taken on channel 2.
VHF High Band voltages taken on channel 7.
UHF Band voltages taken on channel 14.

TUNER TERMINAL GUIDE



CABINET PARTS

MODEL CTN-1050R

Item	Part No.
Cabinet front Assembly	TXFKY890SER
Cabinet Rear	TKU2A24701
6 Button Assembly	TXFBX021SER
Channel, Power, Volume, Menu/Control	

MODEL CTN-1051R

Item	Part No.
Cabinet Front Assembly	TXFKY900SER
Cabinet Rear	TKU2A24702
6 Button Assembly	TXFBX031SER
Channel, Power, Volume, Menu/Control	

MODEL CTN-1060R

Item	Part No.
Cabinet Front Assembly	TXFKY231SER
Cabinet Rear	TXFKU091SER
6 Button Assembly	TXFBX021SER
Channel, Power, Volume, Menu/Control	

MODEL CTN-1061R

Item	Part No.
Cabinet Front Assembly	TXFKY221SER
Cabinet Rear	TXFKU101SER
6 Button Assembly	TXFBX031SER
Channel, Power, Volume, Menu/Control	

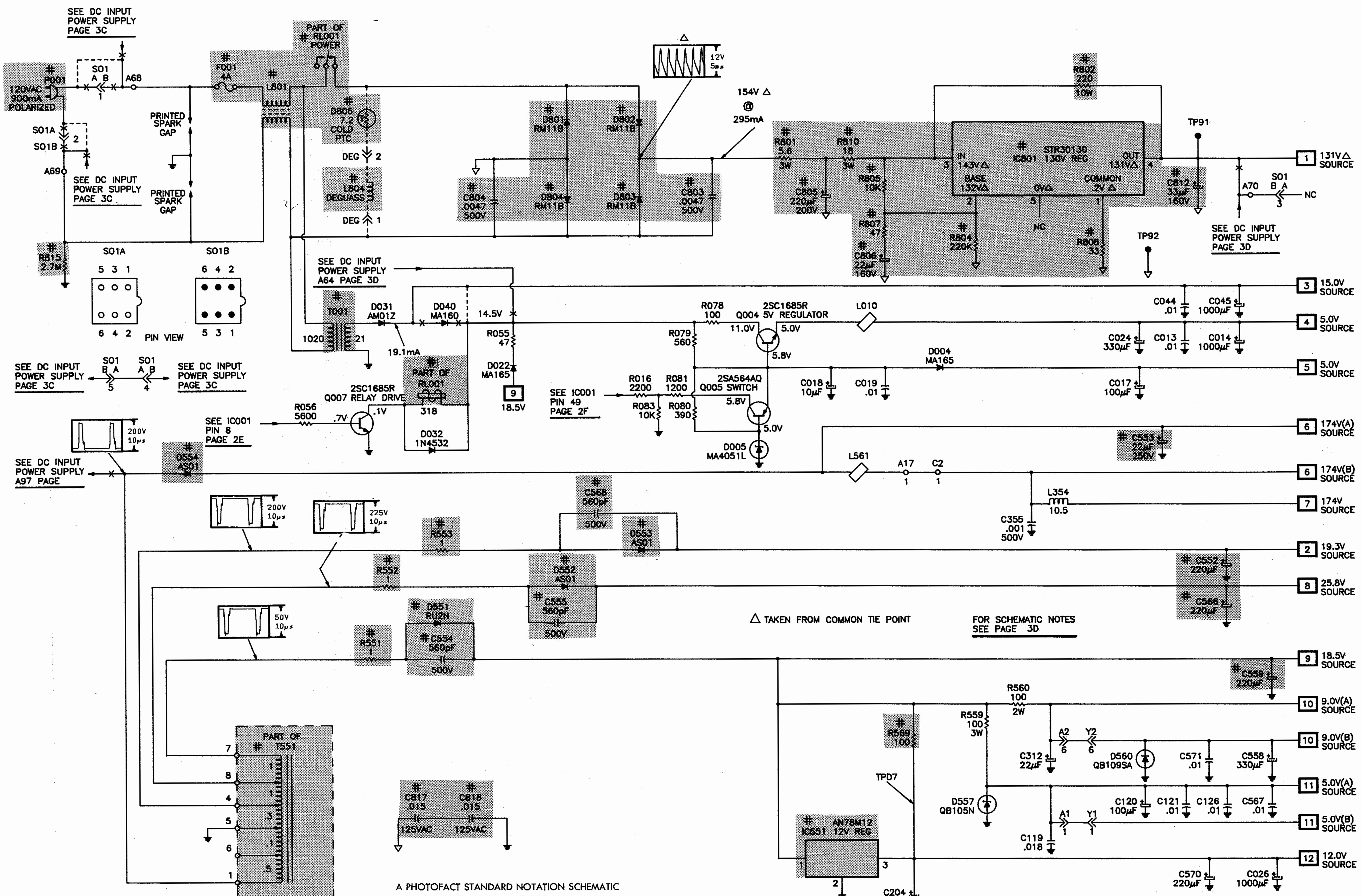
REMOTE CONTROL TRANSMITTERS

Item	Part No.
Battery Cover, EUR641033	UR64EC978
Battery Cover, EUR641231	UR64EC978A

NOTES

A B

AC INPUT POWER SUPPLY SCHEMATIC



A PHOTOFACT STANDARD NOTATION SCHEMATIC

WITH CIRCUITRACE

PARTS LIST continued

SPEAKER

Item No.	Description	Mfr. Part No.	Quam Part No.
SP1	1 1/2"X2 3/4" 16 Ohm	EAS7D11KC-G 7D11KC-G (1)	-

(1) Number on unit.

COILS & TRANSFORMERS

	Item No.	Function	Mfr. Part No.	On-Unit No.	Russell Part No.
#	L570	Yoke 90° Horiz. 4.85mH Vert. 22.2mH	OLY15306FA	OLY15306F	-
#	T001	Power	TLP16297	-	-
#	T501	Horizontal Driver	TLH15412	-	-
#	T502	Horizontal Coupler	ETE19Z30AY	E1930	-
#	T551	Horizontal Output (1)	OLF04701F	-	FBT-217
	T851	Converter, Drive (2)	TLP15903	-	-
#	T852	DC Power (2)	ETS39K70A	-	-

(1) R599A Focus, R599B Screen Controls are part of T551.
(2) Used in Models CTN-1060R, CTN-1061R.
For SAFETY use only equivalent replacement part.

MISCELLANEOUS

	Item No.	Description	Mfr. Part No.	Notes
	D034	LED	SEL1320G	ON Timer
#	F001	FUSE 4.0Amp, 125V	XBA1C40NU100	
#	F852	FUSE 7.0Amp, 125V (1)	XBAIF70NU100	
	L010	Ferrite Bead	EXCELSA24	
	L109	Ferrite Bead	EXCELSA35	
#	L556	Ferrite Bead	EXCELSA24	
	L561	Ferrite Bead	EXCELSA24	
#	L804	Degaussing Coil	OLK19030M	
	L853	Ferrite Bead (1)	TSC909	
	L854	Ferrite Bead (1)	TSC909	
	L855	Ferrite Bead (1)	TSC909	
	L856	Ferrite Bead (1)	TSC909	
	L857	Ferrite Bead (1)	TSC909	
	L858	Ferrite Bead (1)	TSC909	
#	P001	Cord CTN-1050R	OSX110903	AC, White
		Cord CTN1051R	OSX110904	AC, Black
		Cord CTN1060R	OSX111003	AC, White
		Cord CTN1061R	OSX111004	AC, Black
#	P2	Cord (1)	TXASX0111AQM	CAR BATTERY
	S001	Switch	EVQQBH12T	POWER
	S002	Switch	EVQQBH12T	VOLUME DOWN
	S003	Switch	EVQQBH12T	VOLUME UP
	S004	Switch	EVQQBH12T	CHANNEL DOWN
	S005	Switch	EVQQBH12T	CHANNEL UP
	S010	Switch	EVQQBH12T	MENU
#	SO1B	Socket, Power (1)	TYPSOCK1AP	
#	V1	CRT	A26JGZ91X	10"
	X001	Crystal Oscillator	TSS2077MX	
	X101	Saw Filter	EFCH45MVK12N	
	X102	Trap	EFCS4RSMW3BA	4.5MHZ
	X201	Filter	EFCS4R5MS4	4.5MHZ Bandpass
	X501	Crystal Oscillator	EFOA503KS41	
	X601	Crystal Oscillator	TSS816MX	3.58MHZ
		Antenna	OSA100004	UHF/VHF
		Fuse Holder	TJC6320	
		Magnet Assembly	TLC2042	Purity/Convergence
		Socket	TJS1A5050	CRT
		Tuner (2) (5)	ENV568C4G3	UHF/VHF
		Tuner (1) (5)	ENV568C5G3	UHF/VHF
		Transmitter (4)	EUR641033	Remote Control
		Transmitter (3)	EUR641231	Remote Control

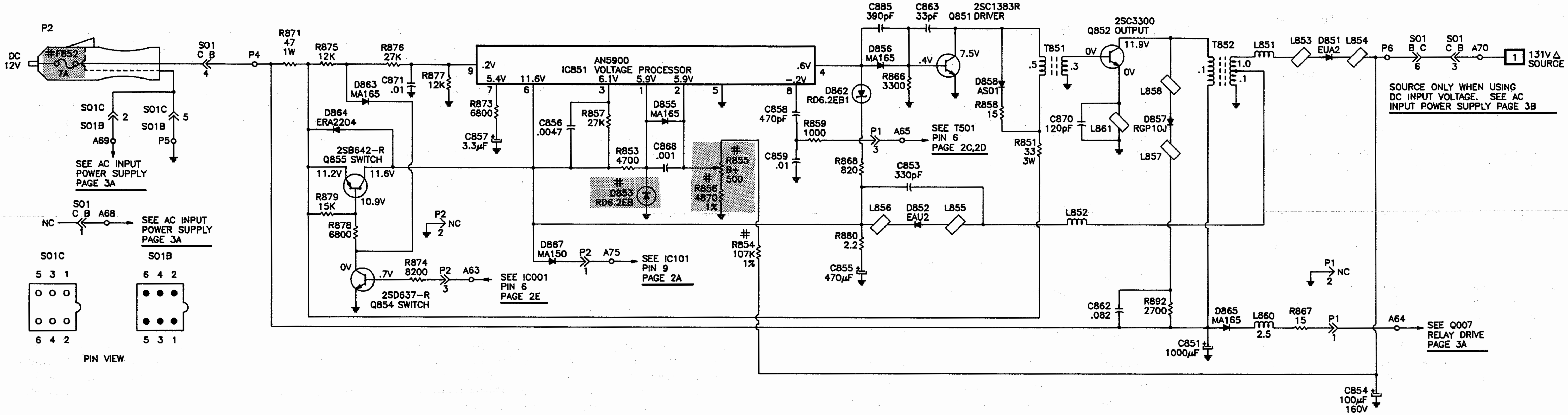
(1) Used in Models CTN 1060R, CTN-1061R.
(2) Used in Models CTN-1050R, CTN-1051R.
(3) Used in Models CTN-1050R, CTN-1060R.
(4) Used in Models CTN-1051R, CTN-1061R.
(5) Contact PTS Electronics Corporation for replacement; order by manufacturer's part number.
For SAFETY use only equivalent replacement part.

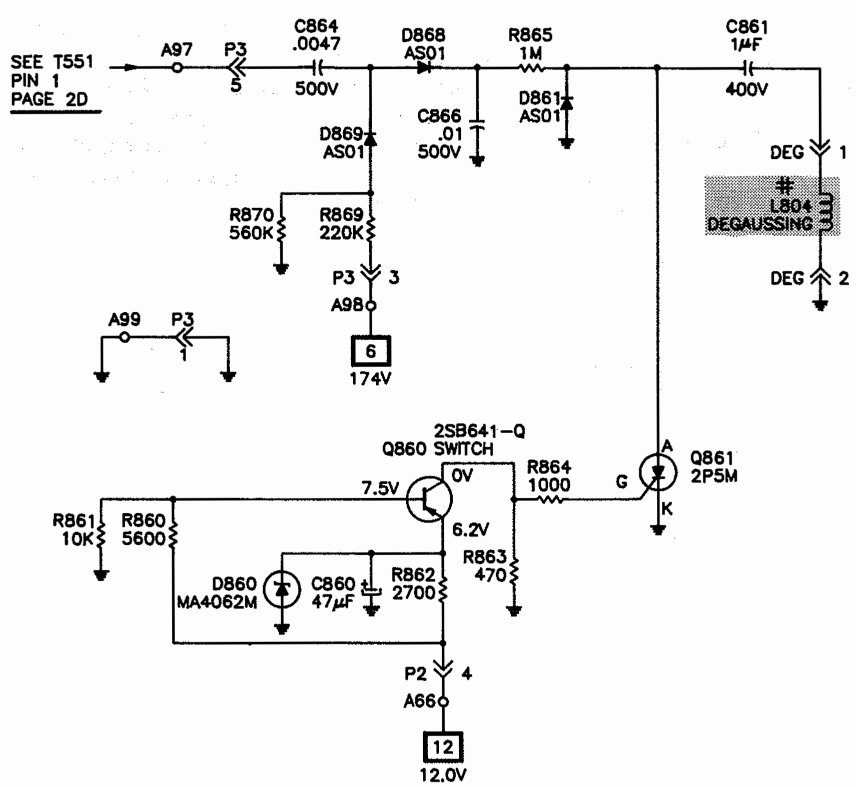
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J. Barker, B. Buchanan, T. Clensy, R. Raus, S. Scott, B. Smith, K. Smith, D. Stitt, D. Urick

DC INPUT POWER SUPPLY SCHEMATIC

VOLTAGES TAKEN WITH
12V DC SOURCE





THIS BOARD NOT USED
IN MODELS CTN–1050R
AND CTN–1051R

For SAFETY use only equivalent replacement part, see parts list.

- Circuitry not used in some versions
- Circuitry used in some versions
- Nominal value
- Ground
- Chassis
- Common tie point

Waveforms and voltages are taken from ground, unless noted otherwise.
Waveforms: triggered scope, keyed rainbow generator.
Supply voltage maintained as shown at input.
Voltages measured with digital meter, no signal.
Controls adjusted for normal operation.
Terminal identification may not be found on unit.
Capacitors are 50 volts or less, 5% or greater unless noted.
Electrolytic capacitors are 50 volts or less, 20% or greater unless noted.
Resistors are 1/2W or less, 5% or greater unless noted.
Value in ( ) used in some versions.
Measurements with switching as shown, unless noted.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
WITH CIRCUITRACE

SAFETY PRECAUTIONS

SERVICE WARNING

ONLY qualified service technicians who are familiar with safety checks and guidelines should perform service work. For continued SAFETY:

1. Before replacing parts, disconnect power source to protect electrostatically sensitive parts.
2. Do not attempt to modify any circuit unless so recommended by the manufacturer.
3. When servicing chassis, use an isolation transformer between the line cord and power receptacle.

SERVICING HIGH VOLTAGE AND PICTURE TUBE

Use EXTREME CAUTION when servicing the High Voltage circuits.

1. To discharge static High Voltage, connect a 10-kilohm resistor in series with a test lead between chassis and picture tube anode lead.
2. DO NOT lift picture tube by the neck.
3. ALWAYS wear shatterproof goggles when handling picture tube to protect eyes in case of implosion.

X-RAY RADIATION AND HIGH VOLTAGE LIMITS

Be aware of the instructions and procedures covering x-ray radiation. In solid-state receivers and monitors, the picture tube is the only potential source of x-rays.

1. Keep an accurate High Voltage meter available at all times. Check meter calibration periodically.
2. Whenever servicing a chassis, check High Voltage at various brightness levels to be sure it is regulating properly.
3. Keep High Voltage at rated value, NO HIGHER. Excessive High Voltage may cause x-ray radiation or failure of associated components. DO NOT depend on protection circuits to keep voltage at rated value.
4. When troubleshooting a set with excessive High Voltage, avoid close contact with picture tube. DO NOT operate set longer than necessary. To locate the cause of excessive High Voltage, use a variable AC transformer to regulate voltage.
5. In present chassis, many electrical and mechanical components have safety-related characteristics which are not detectable by visual inspection. Such components are identified by a # on both the schematic and the parts list. For SAFETY, use only equivalent replacement parts when replacing these components.

SAFETY CHECKS – FIRE AND SHOCK HAZARD

Cold Leakage Checks for Sets with Isolated Ground

1. Unplug the AC cord, connect a jumper across the plug prongs, and turn the power switch ON.
2. Use an ohmmeter to measure the resistance between the jumpered AC plug and any exposed metal cabinet parts such as antenna screw heads, control shafts, or handle brackets. Exposed metal parts with a return path should measure between 200 kilohms and 5 megohms. Parts without a return path must register infinity.

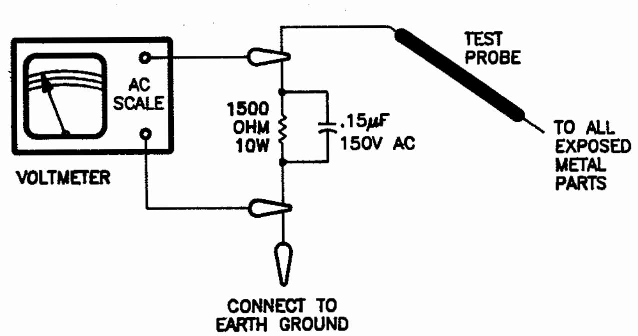
Hot Leakage Current Check

1. Plug the AC cord directly into AC outlet. DO NOT use an isolation transformer.
2. Use a 1500-ohm, 10-watt resistor in parallel with a .15-microfarad 150-volt AC capacitor to connect between any exposed metal parts on the set and a good earth ground. (See figure below.)
3. Use an AC voltmeter with at least 1000 ohms-per-volt sensitivity to measure the voltage across the resistor. Check all exposed metal parts and measure voltage at each point.
4. Voltage readings should not exceed .75 volts RMS (5 milliamps AC). Any value exceeding this limit constitutes a potential shock hazard and must be corrected.
5. If AC plug is not polarized, reverse the AC plug and repeat exposed metal part voltage measurement at each point.

GENERAL GUIDELINES

Perform a final SAFETY CHECK before returning set to customer.

1. Check repaired area for poorly soldered or de-soldered connections, and check entire circuit board for solder splashes.
2. Check inner board wiring for pinched wires or wires contacting any high-wattage resistors.
3. Check that all control knobs, shields, covers, grounds and mounting hardware have been replaced. Be sure to replace all insulators and restore proper lead dress.



NEW CIRCUITS

CRT PROTECTION CIRCUIT

This circuit blanks the CRT in the event of vertical sweep loss and also functions as a CRT spot killer when the Receiver is turned Off. During normal operation the Vertical Sweep waveform from Vertical Output IC (IC451) supplies a positive voltage to the base of CRT Protect Transistor (Q451). The conduction of Q451 grounds the anode of D453 and the diode does not conduct, allowing normal video.
Any failure mode causing loss of the Vertical Sweep waveform will allow C454 to discharge. Q451 will stop conducting as a result of the reduced Base voltage. This allows D453 to conduct and supply roughly 9.0VDC to the video path going to the CRT. The increased DC voltage drives the video information into the black area and blanks the CRT.

When the Receiver is turned Off, the Vertical Sweep waveform disappears but the 9.0VDC decays slowly. Thus the circuit operates to blank the CRT to provide spot burn protection.

Note that any failure mode causing transistor Q451 to be nonconductive will result in CRT blanking. The easiest way to confirm that the blanking circuit is active, causing a no raster symptom, is to measure the collector voltage of Q451. If the voltage is approximately 9.0VDC, D453 is conducting to cause CRT blanking.

HORIZONTAL DISABLE CIRCUIT

This circuit protects against excessive High Voltage. If for any reason High Voltage exceeds a predetermined level, the circuit operates to shift Horizontal frequency and limit High Voltage. Horizontal pulses from pin 6 of Horizontal Output Transformer (T551)are rectified by diode D531. This DC voltage, directly proportional to the High Voltage variations, is filtered and applied to the Base of Horizontal Disable Transistor Q533, thru precision divider network, R532 and R533.
If High Voltage increases, the Horizontal pulse amplitude at pin 6 of T551 increases causing the positive voltage at the cathode of D531 to increase until Q533 starts to conduct.
Q533 acts as a resistance in parallel with the Horizontal AFC Filter circuit R502, C506, C507. The conduction of Q533 lowers it's resistance and dampens the AFC circuit, causing an increase in the Horizontal Oscillator frequency and reducing the High Voltage.

If the Horizontal is off frequency, determine if the cause is the Horizontal circuit or the Horizontal Disable circuit. If the Disable circuit does not operate during the Horozontal Disable Test, the defect must be corrected to insure that the High Voltage operates within safe limits.

Horizontal Disable Circuit Test

Apply power and set all controls for normal operation. Connect a 33K Ohm resistor from Q533 Base to TPD7 (12.0VDC). Horizontal frequency should increase causing receiver to lose Horizontal sync. Voltage at TP91 should measure between 153V and 162V.
If receiver fails to lose Horizontal Sync during test, defect must be corrected. Check Q533, R531, R532, C531, D531, and the amplitude of the waveform at T551 pin 6.

Courtesy of Manufacturer